

Study on bad PMTs

Benji reported that km2 calibration factors at some PMTs get worse on run-by-run basis after RSMON correction. In this slides, we will discuss these PMTs.

Bad PMT list extracted from Benji's report

Most bad PMTs belong to the layer 1. Is there any specific characteristics in layer 1 ?

Yes, ADC counts are totally **small**, (and sometimes histogram is broad/distorted due to the external fluctuation such as pedestal shift)

My assumption :
ADC counts of these bad tubes (including the tubes belonging to other layer) are pretty low.

End, layer, sector

End	layer	sector	
1	2	16	(40) : gain jump
2	8	22	(646) : gain jump
2	1	1	(457) : erratic
2	1	4	(460) : large gain jump
1	1	7	(7) : erratic
1	1	10	(10) : gain jump
2	1	13	(459) : gain jump
2	1	19	(475) :
2	3	4	(508) : discrete change

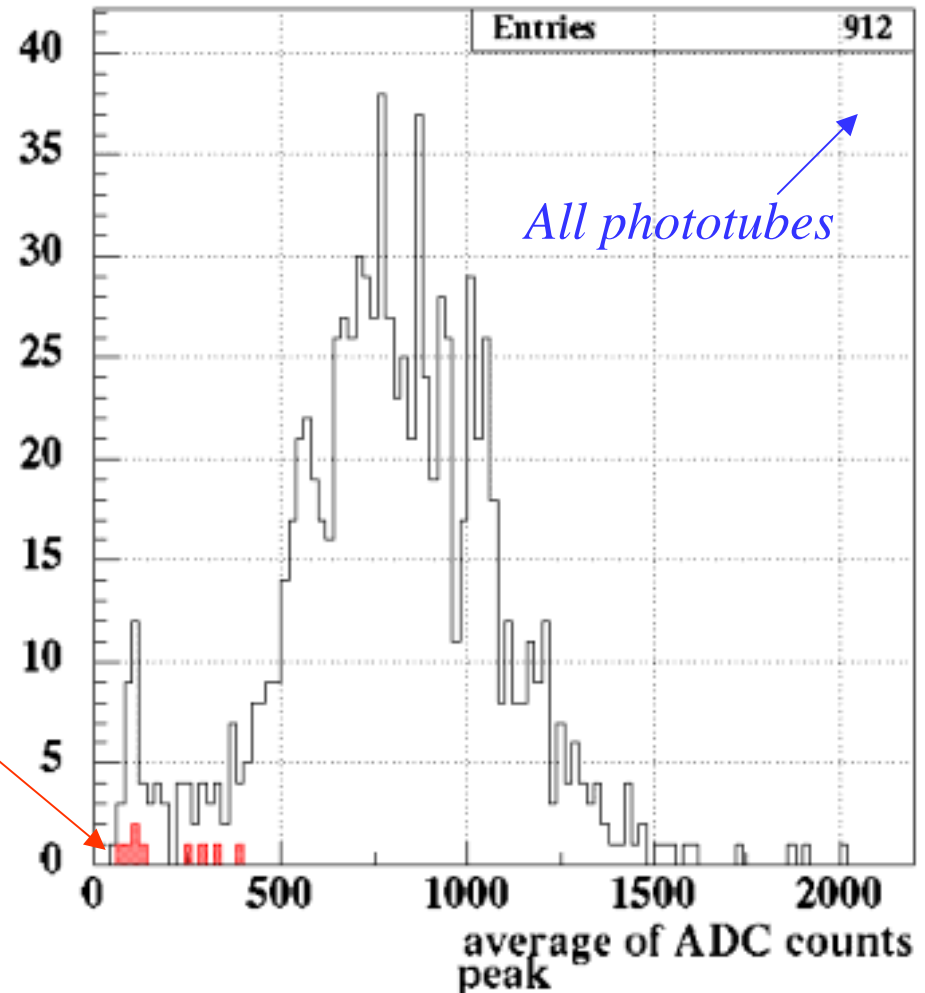
Bad PMT distribution in ADC

ADC average counts of the bad PMTs seem to be low.

Bad PMTs

Another question.

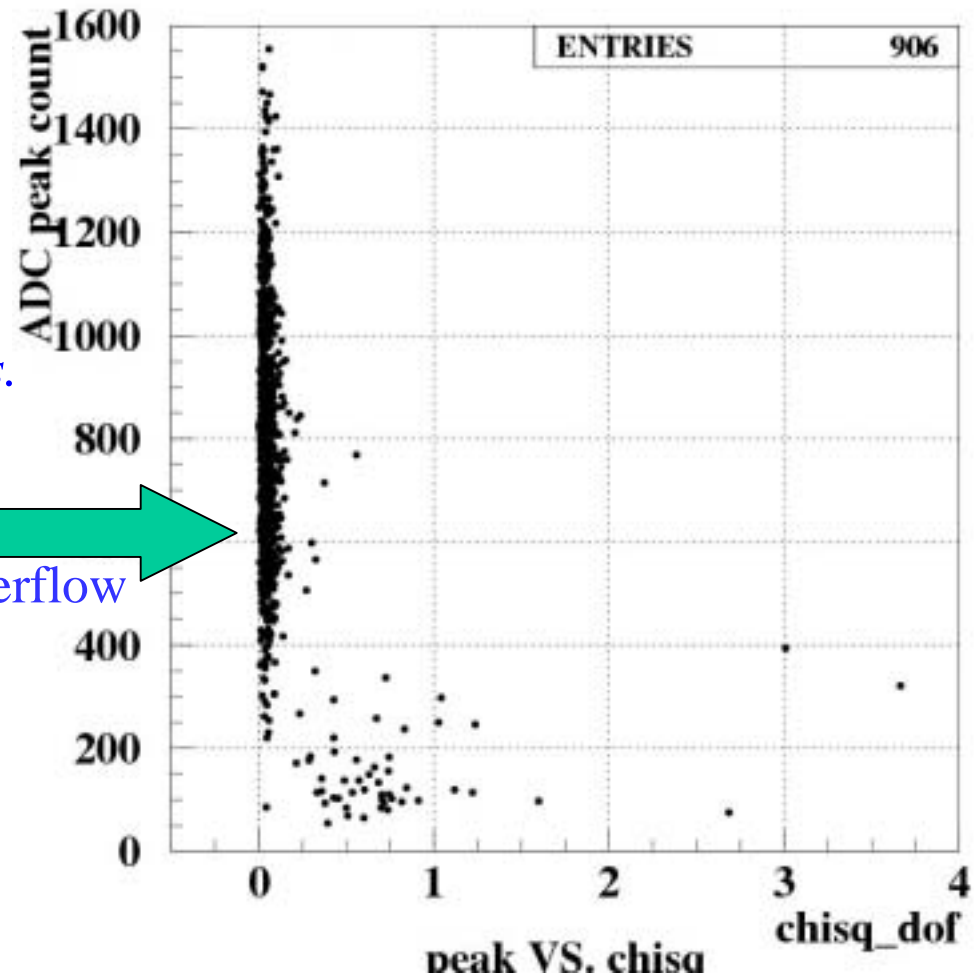
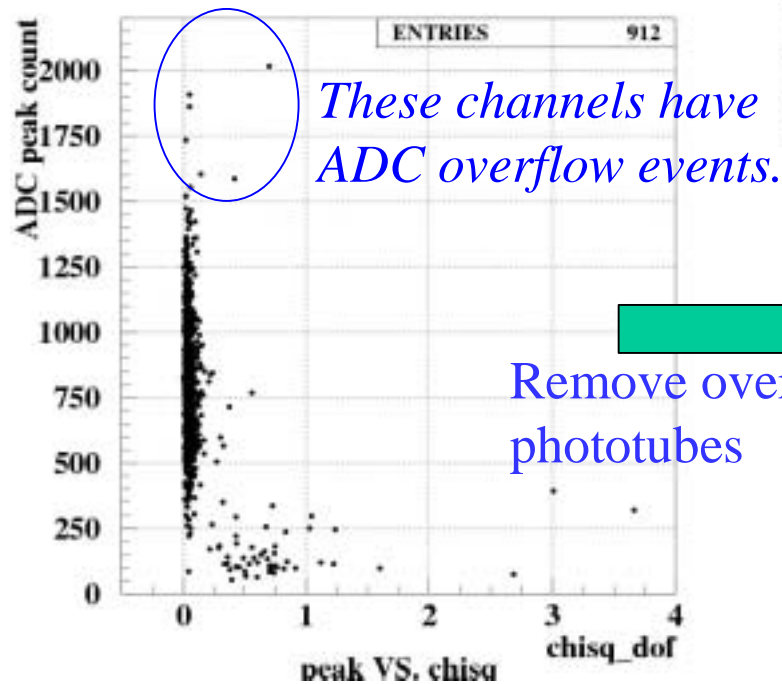
How about other low gain tubes ?
Chisqs are really bad ?



ADC counts

Chisq (from benji's table) vs ADC average

Chisq (badness) vs ADC average



Strong correlation can be seen between chisq(badness) and average ADC counts.

Summary

Bad tubes seem to be the **low ADC tubes**.

It is **difficult to get better calibration factors** at low ADC tubes because their distribution are not sharp and these tubes are easily affected by unknown external factors.

We might be able to have better calibration factors for **2 PMTs**

